SUBJECT: Mathematics year 10H 2019 2020

Topic

Autumn Term 1 (8 weeks)

Calculating with percentages (1½ weeks)

- Solve problems involving percentage change, including:
- percentage increase / decrease problems
- original value problems
- simple interest, including in financial mathematics

Measures (1 week)

- Apply and interpret limits of accuracy, including upper and lower bounds
- Use standard units of measure and related concepts (length, area, volume / capacity, mass, time, money etc)
- Use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate
- Change freely between related standard units (e.g. time, length, area, volume / capacity, mass) and compound units (e.g. speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts
- Use compound units such as speed, rates of pay, unit pricing, density and pressure

Surds (1½ weeks)

- Calculate exactly with surds
- Simplify surd expressions involving squares (eg `sqrt 12 = sqrt(4 xx 3) = sqrt 4 xx sqrt 3 = 2 sqrt 3`) and rationalise denominators
- Recognise and use simple geometric progressions (r^n where n is an integer and r is a surd)

Statistical measures (2 weeks)

- Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through:

Autumn Term 2 (7 weeks)

Indices (1 week)

- Use positive integer powers and associated real roots (square, cube and higher)
- Recognise powers of 2, 3, 4, 5
- **Estimate powers and roots of any given positive number**
- Calculate with roots and with integer and fractional indices

Properties of polygons (2 weeks)

- Derive and use the sum of angles in a triangle (e.g. to deduce and use the angle sum in any polygon, and to derive properties of regular polygons)
- Derive and apply the properties and definitions of:
- special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus
- and triangles and other plane figures using appropriate language

Number recap and review (1 week)

- Change recurring decimals into their corresponding fractions and vice versa
- Apply and interpret limits of accuracy including upper and lower bounds
- Deduce expressions to calculate the nth term of linear and quadratic sequences
- Recognise and use simple geometric progressions (`r^n` where `n` is an integer and `r` is a surd)
- including other sequences
- Calculate exactly with surds
- Simplify surd expressions involving squares and rationalise denominators
- Calculate with roots and with integer and fractional indices

SUBJECT: Mathematics year 10H 2019 2020

Assessment	**Progress Check 1 on the following topics:** Calculating with percentages Measures Approximate Date of Assessment Week Beginning: 23/09/19 **MILESTONE 1 on the following topics:** Calculating with percentages Measures Surds Approximate Date of Assessment Week Beginning: 07/10/19	**Progress Check 2 on the following topics:** Statistical measures Indices Approximate Date of Assessment Week Beginning: 11/11/19 **MILESTONE 2 on the following topics:** Statistical measures Indices Properties of polygons Number recap & review Approximate Date of Assessment Week Beginning: 09/12/19

SUBJECT: Mathematics year 10H 2019 2020

Topic	Spring Term 1 (6 weeks)	Spring Term 2 (6 weeks)

	Congruence and similarity (2nd week of 2)
	
	Pythagoras and basic trigonometry (1½ weeks)
	• Know the formula for Pythagoras' Theorem
	• Apply it to find angles and lengths in right angled triangles **and, where possible, general triangles** in two **and three** dimensional figures
	• Know and use the trigonometric ratios
	• Know the exact values of sin and cos for: 0°, 30° 45°, 60° and 90°
	• Know the exact value of tan for: 0°, 30°, 45° and 60°
	• Apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides including Pythagoras' Theorem and use known results to obtain simple proofs
	• Compare lengths using ratio notation; make links to trigonometric ratios
	
	Simultaneous equations (2 weeks)
	• Solve two simultaneous equations in two variables (linear / linear) algebraically
	• Find approximate solutions using a graph
	• Translate simple situations or procedures into algebraic expressions or formulae
	• Derive two simultaneous equations
	• Solve the equations and interpret the solution
	
	Probability (1½ weeks)
	• Apply ideas of randomness, fairness and equally likely events to calculate expected outcomes or multiple future
		Statistics recap and review (1 weeks)
		• Construct and interpret diagrams for grouped discrete data and continuous data, i.e. histograms with equal and unequal class intervals and cumulative frequency graphs, and know their appropriate use
		• Interpret, analyse and compare distributions of data sets from univariate empirical distributions through appropriate graphical representation involving discrete, continuous and grouped data, including box plots
		• interpret, analyse and compare the distributions of data sets from univariate empirical distributions through consideration of outliers, quartiles and inter-quartile range
		• Draw estimated lines of best fit
		• Make predictions
		• Interpolate and extrapolate apparent trends whilst knowing the dangers of doing so
		Infer properties of populations or distributions from a sample, whilst knowing the limitations of sampling
		
		Algebra – quadratics and rearranging formulae (1½ weeks)
		• Simplify and manipulate algebraic expressions by:
		  ○ expanding products of two binomials
		  ○ factorising quadratic expressions of the form `x^2 + bx + c` including the difference of two squares
		  ○ simplifying expressions involving sums, products and powers, including the laws of indices
		• Understand and use standard mathematical formulae
		• Rearrange formulae to change the subject
		Volume (2 weeks)
		• Compare lengths, areas and volumes using ratio notation
		• Scale factors

SUBJECT: Mathematics year 10H 2019 2020

Assessment	**Progress Check 3 on the following topics:** Congruence and similarity Pythagoras and basic trigonometry Approximate Date of Assessment Week Beginning: 20/01/20	**MILESTONE 3 on the following topics:** Congruence and similarity Pythagoras and basic trigonometry Simultaneous equations Number recap and review Probability Approximate Date of Assessment Week Beginning: 24/02/20

SUBJECT: Mathematics year 10H 2019 2020

Topic	Summer Term 1 (5 weeks)	Summer Term 2 (6 (+1) weeks)
	Algebra recap and review (1 week) • Solve geometrical problems on co-ordinate axes • Use the form y = mx + c to identify parallel and perpendicular lines • Find the equation of the line through two given points, or through one point with a given gradient • Identify and interpret gradients and intercepts of linear functions graphically and algebraically • Plot and interpret graphs (including reciprocal graphs and exponential graphs) and graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematics problems involving distance, speed and acceleration • Solve linear equations in one unknown algebraically • Including those with the unknown on both sides of the equation **Sketching graphs (1 week)** • Recognise, sketch and interpret graphs of linear functions, quadratic functions, simple cubic functions and the reciprocal function. **Linear and quadratic equations and graphs (2 weeks)** • Solve linear equations in one unknown algebraically including those with the unknown on both sides of the equation • Find approximate solutions using a graph • Solve quadratic equations algebraically by factorising • Find approximate solutions using a graph • Translate simple situations or procedures into algebraic expressions or formulae; derive an equation and the solve the equation and interpret the solution	Revision (1 week) Trial Exams (2 weeks) Question Analysis and mock review (1 week) Year 10 Catch up and Strat year 11 based on Question Analysis (2 weeks)

SUBJECT: Mathematics year 10H 2019 2020

Assessm	**Progress Check 4 on the following topics:** Statistics recap and review Algebra – quadratics and rearranging formulae Volume Approximate Date of Assessment Week Beginning: 20/04/20	**TRIAL EXAMS w/c 08/06/20**

SUBJECT: Mathematics year 10H 2019 2020

	Topic	Assessment
Autumn Term 1	**Calculating with percentages** **Measures** **Surds** **Statistical measures**	**Progress Check 1 w/c 23/09/19** ***MILESTONE 1 w/c 07/10/19**
Autumn Term 2	**Indices** **Properties of polygons** **Number recap and review** **Congruence and similarity**	**Progress Check 2 w/c 11/11/19** ***MILESTONE 2 w/c 09/12/19**
Spring Term 1	**Congruence and similarity cont.** **Pythagoras and basic trigonometry** **Simultaneous equations** **Probability**	**Progress Check 3 w/c 20/01/20**
Spring Term 2	**Statistics recap and review** **Algebra – quadratics and rearranging formulae** **Volume**	***MILESTONE 3 w/c 24/02/20**
Summer Term 1	**Algebra recap and review** **Sketching graphs** **Linear and quadratic equations and graphs** **Geometry and measures recap and review**	**Progress Check 4 w/c 20/04/20**
Summer Term 2	**Revision** **Trial Exams** **Question Analysis and review**	**MOCK EXAMS w/c 08/06/20**

***Please note that milestones include topics from the previous progress check.**